What is claimed is:

1   1. A method for determining the centroid (V_c) of a waveform
2   signal indicating how a system responds to an input signal as
3   the value of the input signal is varied over a predetermined
4   range, the waveform being sampled at a set of parameter
5   values (V_i, i=1, ..., n) yielding a corresponding set of
6   sampled amplitudes (A_i, i=1, ..., n), each parameter value
7   and corresponding amplitude forming a sampled point (V_i, A_i),
8   comprising the steps of:
9   a) selecting an amplitude at which to create an
10   interpolated point;
11   b) interpolating a first parameter value corresponding to
12   the amplitude selected in step (a); and
13   c) performing a centroid calculation using only the sampled
14   points with an amplitude greater than a predetermined
15   threshold.

1   2. The method of claim 1 wherein the amplitude selected in step
2   (a) is less than approximately twenty per cent of the maximum
3   sampled amplitude.

1   3. The method of claim 1 wherein the centroid V_c is calculated
2   using as a formula:

$$V_c = \frac{\sum_{i=1}^{n} V_i A_i}{\sum_{i=1}^{n} A_i} ,$$

4   in which A_i is an amplitude of the waveform and V_i is a
5   corresponding physical parameter on which the amplitude of the
6   waveform depends.

1   4. The method of claim 1, wherein the waveform is sampled in the
2   presence of background noise, and the method further
3   comprises the steps of:
4   d) estimating the background (B_i) for each value in the set
5   of parameter values at which sampling is performed; and
6   e) reducing the amplitude (A_i) of each sampled amplitude by
7   the background (B_i) so estimated.

1   5. The method of claim 1, wherein among the sampled amplitudes
2   there is a maximum sampled amplitude, and wherein the method
3   further comprises the step of interpolating a second
4   parameter value to correspond to the amplitude selected in
5   step (a), the second value on the opposite side from the
6   first interpolated value of the maximum sampled amplitude.

1   6. An apparatus for determining the centroid (V_c) of a waveform
2   signal indicating how a system responds to an input signal as
3   the value of the input signal is varied over a predetermined
4   range, the waveform being sampled at a set of parameter
5   values (V_i, i=1, ..., n) yielding a corresponding set of
6   sampled amplitudes (A_i, i=1, ..., n), each parameter value
7   and corresponding amplitude forming a sampled point (V_i, A_i),
8   the apparatus comprising:
9   a) means for selecting an amplitude at which to create an
10   interpolated point;
11   b) means for interpolating a first parameter value
12   corresponding to the selected amplitude; and
13   c) means for performing a centroid calculation using only
14   the sampled points with an amplitude greater than a
15   predetermined threshold.

1   7.   The apparatus of claim 6, wherein the selected amplitude is
2   less than approximately twenty per cent of the maximum
3   sampled amplitude.

1   8.   The apparatus of claim 6, wherein the centroid (V_c) is
2   calculated using as a formula:

$$V_c = \frac{\sum\limits_{i=1}^{n} V_i A_i}{\sum\limits_{i=1}^{n} A_i},$$

3

in which A_i is an amplitude of the waveform and V_i is a
corresponding physical parameter on which the amplitude of the
waveform depends.

1   9.   The apparatus of claim 6, wherein the waveform is sampled in
2   the presence of background noise, and the apparatus further
3   comprises:
4   d)   means for estimating the background (B_i) for each value
5   in the set of parameter values at which sampling is
6   performed; and
7   f)   means for reducing the amplitude (A_i) of each sampled
8   amplitude by the background (B_i) so estimated.

1   10. The apparatus of claim 6, wherein among the sampled
2   amplitudes there is a maximum sampled amplitude, and the
3   apparatus further comprises means for interpolating a second
4   parameter value to correspond to the selected amplitude, the
5   second value on the opposite side from the first interpolated
6   value of the maximum sampled amplitude.